

Exhibit 4

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UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
SAN FRANCISCO DIVISION

ORACLE AMERICA, INC.
Plaintiff,
vs. Case No. 3:10-cv-03561-WHA
GOOGLE, INC.,
Defendant.

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PURSUANT TO THE PROTECTIVE ORDER

VIDEO DEPOSITION OF GREGORY K. LEONARD, Ph.D.
San Francisco, California
Friday, March 11, 2016
Volume I

REPORTED BY:
REBECCA L. ROMANO, RPR, CSR No. 12546
JOB NO. 2241706
PAGES 1 - 405

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<p>1 he says there is wrong. 2 I think those are the major ones. 3 Q. Anything else? 4 A. I mean, those are the ones that leap to 5 mind. I'm happy again to re- -- re-invite you to 6 give me the report and I'll be happy to go through 7 it. 8 Q. How is Mr. Malackowski's calculation of 9 TAC wrong? 10 A. Well, I think his claim is that the -- 11 the -- the TAC for search is somehow already in the 12 line items for -- under cost of sales for digital 13 content and apps, I think, and that therefore when, 14 you know, I've done a TAC calculation and it 15 included some for search, that it's overstated. 16 But, I mean, it's just he's wrong about 17 that. The payments that are included under digital 18 content and apps to partners are not for the types 19 of things we were talking about before. It's when 20 a user, for instance, pays for an app and then -- 21 but has it billed through his carrier statement. 22 So that's the only thing that's included 23 there. 24 And, of course, if you think about it, it 25 just doesn't make any -- Mr. Malackowski's claim</p> <p style="text-align: right;">Page 214</p>	<p>1 Q. So where did you get your TAC number for 2 search? 3 A. It's calculated in Exhibit 1- -- let's 4 see -- 1a -- sorry -- 1d. 5 Q. Let me ask you something. You had all 6 the access to Google that you wanted here in order 7 to get any data that you wanted to perform your 8 analysis or confirm the accuracy of any your 9 analysis, right? 10 A. Right. 11 Q. Now TAC for search, that's -- that's a 12 knowable number, right? It's a number that they 13 actually paid to their search advertising partners, 14 right? 15 MR. PURCELL: Object to the form. 16 THE DEPONENT: It's -- they certainly 17 paid TAC to people, yes. 18 Q. (By Ms. Hurst) Yeah. And you could go 19 and find out exactly how much TAC Google paid to 20 people, right, for this period of time? 21 MR. PURCELL: Object to the form. 22 THE DEPONENT: I mean, I don't believe 23 that's what they record in their systems. What 24 they record in their systems is, for instance, 25 reflected in Exhibit 1d.</p> <p style="text-align: right;">Page 216</p>
<p>1 doesn't make any sense. Why would the TAC for 2 search be reported in the cost of sales on the 3 Android P&L and have the revenue that's associated 4 with that TAC be reported on the ad P&L, which is, 5 you know, where it is? 6 And the answer is, well, it's wrong, 7 because the ad -- I mean, the TAC is also on the 8 add P&L. And I describe how to -- to tease that 9 out in my exhibits. 10 And on top of that, you know -- further, 11 I talked to Google about this, and -- and, you 12 know, that's -- the way I did it is consistent with 13 what I just said and inconsistent with the way 14 Mr. Malackowski did it. 15 And then, finally, if you look at the 16 actual numbers for 2008, '9, and '10, where Google 17 actually reported the TAC on the Android P&L, if 18 you look at the TAC as a percentage of revenue for 19 those years, it's basically the same kind of 20 numbers that I'm getting for the 2011 to 2015 21 period, and a lot higher than the numbers that 22 Mr. Malackowski is getting. 23 So, you know, that's again just a further 24 demonstration that the way I did it was correct and 25 the way he did it was incorrect.</p> <p style="text-align: right;">Page 215</p>	<p>1 Q. (By Ms. Hurst) Well, did you go look at 2 their systems? 3 MR. PURCELL: Object to the form. 4 THE DEPONENT: I talked to them about 5 their systems, yes. 6 Q. (By Ms. Hurst) Did you look at the 7 systems yourself? 8 A. No. I talked to them about the nature of 9 their systems. 10 Q. Okay. You did not look at the systems 11 yourself. 12 MR. PURCELL: Object to the form. 13 THE DEPONENT: I did not look at the 14 systems myself. 15 Q. (By Ms. Hurst) For example, you did not 16 look at Hyperion? 17 A. I did not look at Hyperion. 18 Q. And you don't know whether Hyperion 19 records actual numbers for search-related TAC, 20 true? 21 A. I do not know one way or the other 22 whether it does. 23 Q. And you're relying on Mr. Gold's 24 information in concluding that you have to derive a 25 number for search-related TAC, true?</p> <p style="text-align: right;">Page 217</p>

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<p>1 A. Well, let's say not entirely. Because as 2 I just mentioned, I did compare it in the 2011 to 3 2015 period to the earlier period, and I'm getting 4 similar numbers which suggest that, you know, the 5 way that I went about it is -- is correct.</p> <p>6 Q. Well, using the appearance of similar 7 numbers to conclude the way you went about it is 8 correct makes the assumption that the rate of 9 revenue sharing remain the same throughout the 10 period, doesn't it?</p> <p>11 A. Well, I mean, I guess -- it -- it -- 12 it's -- that the TAC as a percentage of revenue 13 would have been about the same, which, you know, is 14 generally true. It's just, as an overall level, 15 you can see it in the data.</p> <p>16 Q. Well, did you look at any of the 17 agreements to see whether there were escalation 18 clauses that provided for increased percentages of 19 revenue sharing over time?</p> <p>20 A. No. I looked at the actual data which is 21 here in front of us.</p> <p>22 Q. Did you look at the agreements that 23 provide for the percentage rate of sharing to 24 determine whether they had increased over time?</p> <p>25 MR. PURCELL: Object to the form.</p> <p style="text-align: right;">Page 218</p>	<p>1 case. And second of all, as I'm trying to explain 2 to you, I looked at the actual data.</p> <p>3 Q. (By Ms. Hurst) Did you ask for those 4 agreements to verify whether they had maintained a 5 constant rate of revenue sharing?</p> <p>6 MR. PURCELL: Object to the form.</p> <p>7 THE DEPONENT: I did not ask for those 8 agreements, no.</p> <p>9 Q. (By Ms. Hurst) Have you seen any 10 evidence in the case to suggest that perhaps there 11 might be revenue sharing agreements that increase 12 over time or with larger volumes?</p> <p>13 A. But at the end of the day, what matters 14 is what the actual data shows, so...</p> <p>15 MS. HURST: Move to strike as 16 nonresponsive.</p> <p>17 Q. (By Ms. Hurst) Have you seen any 18 evidence in this case that suggests that there 19 might be revenue sharing agreements that increase 20 in percentage over time or with larger volumes?</p> <p>21 MR. PURCELL: Object to the form.</p> <p>22 THE DEPONENT: My answer actually was 23 responsive.</p> <p>24 I'm saying I'm looking at the actual 25 data, and it seems to be inconsistent with what</p> <p style="text-align: right;">Page 220</p>
<p>1 THE DEPONENT: Well, again, I looked at 2 the actual data. I think that's the better thing 3 to look at.</p> <p>4 Q. (By Ms. Hurst) Well, you derived the 5 calculation, though, right?</p> <p>6 You didn't look at some category for TAC 7 search expense that was reported in the 2011 to 8 2015 period. You derived it, true?</p> <p>9 A. No. Look at -- I mean, the numbers in 10 Exhibit 1d under Google Advertising TAC are the 11 actual TAC.</p> <p>12 Q. Well, we're talking the search TAC, 13 right?</p> <p>14 A. Yeah, that's the AdWords TAC.</p> <p>15 Q. Did you look at the agreements to 16 determine whether the rate of percentage sharing 17 increased over time?</p> <p>18 MR. PURCELL: Object to the form.</p> <p>19 THE DEPONENT: Well, which agreements are 20 you talking about?</p> <p>21 Q. (By Ms. Hurst) The revenue sharing 22 agreements associated with Google Search?</p> <p>23 MR. PURCELL: Same objection.</p> <p>24 THE DEPONENT: Well, first of all, I 25 don't think that those have been produced in this</p> <p style="text-align: right;">Page 219</p>	<p>1 your question seems to imply.</p> <p>2 Q. (By Ms. Hurst) Well, when you say you're 3 looking at the actual data, what you mean is you're 4 looking at the data you derived.</p> <p>5 MR. PURCELL: Object to the form.</p> <p>6 THE DEPONENT: This is the Google 7 advertising TAC. There's no derivation. It's 8 right off of their P&L statements.</p> <p>9 Q. (By Ms. Hurst) For 2011 to 2015?</p> <p>10 A. Yes.</p> <p>11 Q. Dr. Leonard, I would like to -- to ask 12 you some hypothetical questions.</p> <p>13 Have you ever heard of Napster?</p> <p>14 A. Napster?</p> <p>15 Q. Yes.</p> <p>16 A. Yes.</p> <p>17 Q. What was Napster?</p> <p>18 A. Napster was a music sharing service.</p> <p>19 Q. And do you remember approximately when 20 Napster first came out?</p> <p>21 A. I don't remember the exact date, but, I 22 don't know, late 1990s, early 2000s.</p> <p>23 Q. And Napster was an unlicensed 24 distribution service for music, right?</p> <p>25 MR. PURCELL: Object to the form.</p> <p style="text-align: right;">Page 221</p>

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<p>1 we're happy to take a break. 2 THE DEPONENT: That's fine. 3 EXAMINATION 4 BY MR. COOPER 5 Q. Okay. My name is John Cooper. I'm with 6 the law firm of Farella Braun + Martel, and I -- I 7 represent Dr. Kearl, who sits next to me. And I 8 have some very nuts-and-bolts questions to ask you 9 about your report. 10 A. Okay, sure. 11 Q. Okay. And I don't know if you know what 12 a Rule 706 expert is, but it is an expert that was 13 appointed under Evidence Code Rule 706, by 14 Judge Alsup. And so we are not here with either 15 party in mind. 16 A. Sure, understood. 17 Q. Okay. And I'm, for the most part, going 18 to ask you about paragraphs in your report, and 19 that's Exhibit 5143. 20 A. Okay. 21 Q. I'd like to start with paragraph 19. 22 A. Okay. 23 (Discussion off the stenographic record.) 24 Q. (By Mr. Cooper) Refer to paragraph 19, 25 and you say in there, in that sentence -- in that</p> <p style="text-align: right;">Page 334</p>	<p>1 Q. Is just -- is just the change enough, or 2 does the magnitude of the change have to be 3 considered? 4 A. Oh, oh, I see. In doing this kind of -- 5 Q. Yes. 6 A. -- causal nexus? 7 Well, I think that may be -- I guess 8 maybe there might be some legal stuff in there, but 9 basically, me, I could argue, if there's difference 10 then you have met -- yeah, there's at least some 11 small causal effect, yeah. I mean, it's in 12 principal, if it's anything other than zero. But 13 if it's small, it may be very hard to measure. And 14 if there's a lot of -- else going on, you may not 15 be able to precisely determine whether there was an 16 effect or not. 17 Q. Okay. Turn now to paragraph 23, please. 18 A. Okay. 19 Q. And you -- you are welcome to read any 20 portion of that you want, but if Google's revenues 21 per mobile device were higher on devices using 22 Android than on mobile devices using other 23 operating systems, would that be sufficient to 24 establish a causal nexus for those revenues? 25 A. Maybe a causal nexus to Android, but not</p> <p style="text-align: right;">Page 336</p>
<p>1 paragraph, "the appropriate conceptual way to 2 measure the causal effect of a factor on an outcome 3 variable is to compare the difference in the 4 outcome variable between the actual world" -- 5 "world and the counterfactual," close quote, world. 6 Would a small change in your test for 7 causality work? 8 MR. PURCELL: Object to the form. 9 THE DEPONENT: You mean would a small 10 change -- could a small change be evaluated using 11 this approach? 12 Q. (By Mr. Cooper) Yes. Or do you need to 13 evaluate the size of the change before making the 14 calculation regarding the change? 15 A. Well, I mean, this is a very conceptual 16 statement. I mean, it's true as a general matter. 17 You may have difficulty measuring the effect of a 18 small change, but this is a conceptual matters, how 19 economists define causality. And there's a big 20 literature in economics about that. 21 Q. Okay. Let me ask you, could a change 22 itself work or -- as opposed to the size of the 23 change? 24 A. I am sorry, I'm not sure I understand 25 it -- could the change...</p> <p style="text-align: right;">Page 335</p>	<p>1 necessarily to the 20 -- 37 -- not necessarily to 2 the alleged infringement, I think is how I'd answer 3 that. 4 In other words, if we compare something 5 with or without Android, that tells us something 6 about Android, but I think the causal nexus we are 7 interested in here is the nexus to the alleged 8 infringement itself, the 37 APIs. 9 Q. Okay. Now, please turn to paragraph 33. 10 It's on page 21. And I know Miss Hurst asked you 11 questions about TAC, which is traffic acquisition 12 cost -- 13 A. Yes. 14 Q. -- and I would like to ask you some more 15 questions about that. 16 You -- at the bottom of that paragraph 17 you recite what the TAC rates are for 2008, 2009 18 and 2010. 19 Why there is a variance in those rates, 20 and why is the rate for 2009 so slow? 21 A. I am not sure I know the answer to that. 22 I mean, these particular TAC figures, and then the 23 percentages here, were reported directly in a 24 Google-Android P&L that I think was available in 25 the last case, as I remember. So there's nothing</p> <p style="text-align: right;">Page 337</p>

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<p>1 calculated there. Those are just the numbers. And 2 I'm not sure why variance exist. 3 Q. And you don't know why the 2009 number 4 was lower? 5 A. I do not, no. 6 Q. You understand when I use the 7 acronym TAC, that I'm talking the traffic 8 acquisition costs -- 9 A. Yes. 10 Q. -- okay? 11 For Android phone, does Google pay a TAC 12 to an OEM? 13 A. For an Android phone does it pay TAC? 14 For -- and I guess -- and you mean on search ads? 15 Q. Yes, including search. 16 A. Yeah. I think it's possible. 17 Q. But you don't know one way or the other? 18 A. Yeah, and it may have changed over time, 19 so... 20 Q. For a non-Android phone, what TAC does 21 Google pay to the OEM, if any? 22 A. For no-Android phone, I mean the one I'm 23 familiar with is -- is Apple, there's iPhone. And, 24 you know, as I discuss, that's basically -- based 25 on that Google document, it's about 32 percent TAC.</p> <p style="text-align: right;">Page 338</p>	<p>1 TAC to the carrier? 2 A. To the carrier? Again, I think generally 3 not, but there might be some. 4 Q. Okay. For a non-Android phone, what TAC 5 does Google pay to the carrier? 6 A. Again, the major example there would be 7 iPhone, which their -- I don't think -- I'm pretty 8 sure they don't pay anything to the carrier in that 9 case. 10 Q. Okay. So there wouldn't be any variance 11 depending on the type? 12 A. I believe so, yeah. 13 Q. Okay. Does Google pay a TAC to anyone 14 other than the carrier of the OEM? 15 A. And the Website owner. 16 Q. The Website owner? 17 A. Yeah. 18 Q. And how is that calculated? 19 A. Again, those are the -- those are 20 included in the TAC amounts. Those are the display 21 ads, for instance, with -- the biggest source of 22 TAC there is the payment to the Website owner on 23 which the ad is being displayed. 24 Q. Okay. Now, you may have answered this, 25 but let me ask it anyway for clarification.</p> <p style="text-align: right;">Page 340</p>
<p>1 Q. Thirty-two percent. Okay. 2 And you asked about search revenue, does 3 it vary -- does the amount of revenue or type of 4 revenue vary with search, or AFS, or display? 5 A. You mean the amount of TAC? 6 Q. Yeah. 7 A. Yeah, the amount of TAC is a lot higher 8 for those other two, because you are -- you are 9 really paying a Website owner in those cases. And, 10 you know, I think for whatever -- for whatever 11 reason, the -- you end up paying a lot more to the 12 Website owner. So if you look at the TAC rates in 13 like 1a -- sorry, my exhibit 1a -- I am sorry. 14 Q. Does -- does it vary for the amount that 15 is paid to the OEMs? 16 A. Does it vary from, you mean? 17 Q. Well, for the -- for the different types 18 of search -- different types of payments or sources 19 for payment? 20 A. Well, see, I don't think they pay the 21 OEMs for the, for instance, display ads. Display 22 ads would be -- or at least a vast majority of it 23 is, you are paying the owner of the Website that is 24 showing -- on which the ad is being shown. 25 Q. For an Android phone, does Google pay any</p> <p style="text-align: right;">Page 339</p>	<p>1 In your Android TAC calculations, do 2 these costs include payments to the OEMs, and 3 payments to the carriers, and payments to Google 4 network members? 5 A. Yeah, they would include all forms 6 of TAC. 7 Q. Okay. So your -- your Android 8 calculations would. 9 A. Yes. 10 Q. Okay. Now, I'm going to refer you, if 11 necessary, to your Exhibit 1d? 12 A. Okay. 13 Q. And I -- the question is, you estimate 14 Android search TAC by using overall Google AdWords 15 TAC-to-revenue ratio, applying it to Android search 16 revenue. This revenue range is from 5.3 to 17 8.1 percent. This is much lower than the Android 18 search TAC paid to carriers as discussed -- 19 discussed elsewhere. 20 Do you know why? 21 A. Well, this would include everything, sort 22 of a weighted average of all TAC being paid. So I 23 think the answer is that they are not really paying 24 the carriers. I mean, the payments to carriers on 25 net are very, very low, and so they don't end up</p> <p style="text-align: right;">Page 341</p>

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<p>1 adding up to much here. 2 Q. Now, refer to paragraph 44, please. 3 A. Okay. 4 Q. It appears here that you used two 5 different methods to allocate some different 6 overhead costs. For example, here you indicate 7 that you allocate SG&A, which I -- G&A, which is an 8 accounting term, using a ratio of engineers in the 9 Android division to all Google engineers. But on 10 paragraph 48, you allocate search and ad op expense 11 using a regression, per footnote 70. 12 Is there a reason you didn't use a 13 regression in both or, alternatively, an engineer 14 ratio in both? 15 A. Yes. I mean, the engineering one 16 headcount ratio was the natural one for the general 17 administrative because -- or the particular 18 categories I looked at. Like, if you take real 19 estate, that's like the office expenses. So you 20 know, you have a number of engineers, right, 21 sitting in office space. 22 And so the amount of that office space 23 costs that are Android, as opposed to other parts 24 of Google, would be proportional to the number of 25 engineers in Android. So that sort of made sense</p> <p style="text-align: right;">Page 342</p>	<p>1 Q. All right. Let's turn to paragraph 48, 2 please. 3 A. Okay. 4 Q. Now, you include, and this is in quotes, 5 incremental Search and Advertising expense, close 6 quote, of \$2.4 billion in Exhibit 1a.1; however, 7 you don't include them in Exhibit 1a.4, for profit 8 apportioned to Android versus search, ad, 9 technologies, and services. 10 A. Right. 11 Q. Are they incremental to Android or not? 12 A. They are incremental to the ad revenue, 13 if you consider all the ad revenue. So that's why 14 they are in 1a.1. But over in 1a.4, what I am 15 trying to do is, I've already broken up the ad 16 revenue between -- I've apportioned it between, on 17 the one hand, the advertising and search side of 18 things, and then the rest is going to Android. 19 And, you know, I'm thinking about it in 20 terms of, again, what happens when Google and -- 21 and Apple get together, and there's a Google search 22 add that's placed on Apple. What happens, Apple 23 gets, you know, roughly 32 percent of the revenue, 24 and then it deals with all the costs on the 25 platform side; and Google gets the remainder of</p> <p style="text-align: right;">Page 344</p>
<p>1 as a way to do it there. 2 When I got to the Search and Advertising 3 Product Areas, the -- the OpEx there, the problem, 4 I guess, is that you don't really have a breakdown 5 of how many people in Search and Advertising 6 groups, the engineers there are working on Android, 7 or what percent of their time was on Android. That 8 would have been a nice way to do it, but they just 9 didn't keep that data. 10 So that's why I had to turn to something 11 else, and, you know, so I talk in here about, I 12 notice that the -- you know, as the revenues of 13 Search and Advertising went up, the expenses were 14 going up too, which makes certain amount of sense, 15 you're adding a people that deal with it all, and 16 it's costing more, and obviously the Android 17 portion of -- of the ad -- ad revenue was part of 18 that driver, and so that's how I approached that 19 there. 20 So it's a different set of operating 21 expenses in paragraph 48. It's a Search and 22 Advertising Product Area OpEx, whereas the other 23 parts, you know, are -- are, again, things I can 24 break down based on Google engineers -- sorry -- 25 Android engineers.</p> <p style="text-align: right;">Page 343</p>	<p>1 that, which is 68 percent, and then it has to bear 2 all the advertising and search costs because that's 3 what it is providing. 4 So when I go in 1a.4, and I'm trying to 5 figure out the apportionment of the profit to 6 Android, I first of all figure out the 7 apportionment of the revenue. And then when I get 8 to the costs, I say, well, all the costs that 9 Android costs I'm going to list here. But, for 10 instance, the Search and Advertising incremental 11 costs, I say, no, those are part of the search 12 business and would be borne by -- by them. 13 So I'm sort of apportioning both the 14 revenues and the costs. And, therefore, I end up 15 dropping here the Search and Advertising 16 incremental costs because they would not be part of 17 the Android part of things. 18 Q. Let's refer to paragraph 62 through 64, 19 please. And my question relates to the difference 20 using a ratio of margin versus revenue. 21 You state that 68 percent of Google ad 22 revenue should be attributed to Google search and 23 ad technologies, and only 32 percent to Android. 24 You base this on a ratio of the annual ad search 25 revenue for an Android phone and the comparable</p> <p style="text-align: right;">Page 345</p>